1.08 Management Unit Water Monitoring – Level

Updated 1/14/2016

This survey is conducted weekly and is used to monitor water depth (ft) at set locations throughout the Refuge. **Measurements are taken by recording water level from a fixed staff gauge <u>every week</u>**.

<u>What to Take in the Field</u>:

- **Datasheets**
- **Trimble** with the Water Level Monitoring map loaded on it.
- **Pencil/s**
- **Clip Board**

<u>Datasheets</u>: Blank datasheets are located on the local server at: ***I:\BIOLOGY PROGRAM\INVENTORY and MONITORING PLAN (IMP)_ISIs and SOPs\Initial Survey Instructions (ISIs)\1.08 Management Unit Water Monitoring – Level\Current.***

<u>Survey Methodology</u>: Navigate to each water level monitoring site (use the '**Locating Survey Sites**' section provided below if needed. Once at each site, you will exit your vehicle and careful navigate around until you can see/read the staff gauge at that location. <u>Be careful of slick stops due to lose rocks, ice or mud</u>. Read the **depth (ft)** at which the water surface crosses the staff gauge. Record that value for that survey site. Make sure to visit each survey site <u>once a week</u>.

<u>Water Level Monitoring Map</u>: This map is located on the local server (***I:\GIS DATA and MAPS\Maps\Water Management***) and is titled: **WaterLevelMonitoringSites.** Instructions on loading and using the survey map on the Trimble are included below in the '***Locating Survey Sites'*** portion of the ISI.

<u>Data Entry</u>: Data should be entered into the Excel database located on the server at: ***I:\BIOLOGY PROGRAM\Databases*** and is title **'DATABASE_1.08 Management Unit Water Monitoring – Level**'.

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Locating Survey Sites:

PRIOR TO HEADING INTO THE FIELD:

1) **Turn on the Trimble**.
   a) Turn on the unit to be used by tapping the green power button toward the bottom of the Trimble unit. Depending on the unit series (2000 or 6000), the boot up process may take a few minutes.
2) **Check the Battery Level**.
   a) Check the battery level by looking at the battery icon in the upper right corner of the screen.
      i) Make sure the battery has 3-4 vertical bars showing.
         (1) If there are less than 3 bars and you are planning on using the Trimble for a long period that day, consider switching to another Trimble unit with more battery life if available and make sure to turn off the current unit* (see below for proper instructions to ensure the unit is turned off and not sleeping) and place the unit on its correct charging port.
         (2) If you see a red '!' within the battery icon, this Trimble has very low battery life and is not going to be usable in the field at this time and you will need to switch to another Trimble unit. When this happens, make sure to turn off the current unit* and place the current unit on its correct charging port, this unit will not be useable in the field for several hours.
         **If the unit is not turned off properly prior to charging, the unit may not charge properly causing a further delay prior to it being usable in the field.*

3) **Open ArcPad and see if the 'WaterLevelMonitoringSites' Map is loaded on that Trimble.**
   a) Open ArcPad.
      i) For the **2000 series**: Use the attached stylus to tap on the ***'Start'*** button located in the upper left corner of the screen – a drop down menu should appear. From the menu, tap on the ***'ArcPad'*** icon to open the program. Wait for the program to open completely.
      ii) For the **6000 series**: Use the stylus to tap on the ***'Windows'*** icon located in the lower left corner of the startup screen – this should send you to anther screen with several program icons available. Use your stylus to scroll down the screen by dragging the tip from the lower portion of the screen to the upper portion. Continue to scroll down until you see the ***'ArcPad'*** icon appear. Tap on the '***ArcPad'*** icon to open the program. Wait for the program to open completely.

   b) Check to see if '**WaterLevelMonitoringSites** 'Map is loaded on that Trimble.
      i) Once ArcPad opens, tap the '***Choose Map to Open***' option.
      ii) Looks under the '***Folder***' column for the '***Water Spring Flow Sites***' Map.
      iii) If it is there select that map and go to **step 5**. If it is **not** there, go to **step 4.**

4) **Add 'WaterLevelMonitoringSites' Map to Trimble Unit**.
   a) Open the '**BBS_Survey_Stops'** Map in GIS.
      i) On a computer with GIS, open ArcMap.
      ii) Once ArcMap opens a box will appear with options. On the left-hand side of the box, under ***'Existing Maps***'select '***Browse for more...***'
      iii) Navigate to: ***I:\GIS DATA and MAPS\Maps\Water Management***
      iv) Select '**BBS_Survey_Stops'**.

b) Export **ArcMap** '**WaterLevelMonitoringSites'** Map to an **ArcPad** '**WaterLevelMonitoringSites'** formatted Map.

i) Make sure the ArcPad Data Manager toolbar is accessible. If it appears on the main screen, go to **step 4-b-iii**, if it is not go to **step 4-b-ii**.

ii) Add the toolbar to the main screen by going to '**Customize'** → '**Toolbars'** → and click on **'ArcPad Data Manager'**.

If the icons on the **'ArcPad Data Manager' are greyed out, you will need to active the toolbar by going to '**Customize'** → **'Extensions'->** and checking the box by **'ArcPad Data Manager'.***

iii) Click on the icon that looks like a Trimble with an arrow pointing to the **right**.

iv) You are <u>not</u> checking out an RLGIS shapefile database for this, click '***No***'.

v) In the window that appears, the middle column is titled '**Actions**'; click in that column next to where it says '***WaterLevelMeasuringSite'*** (*you can click and drag a column divider to expand a column to see the entire name*) and select '***Export as background data***' → '***Make read only'***.

vi) Repeat **step 4-b-v** for '**Management Units'** and click '***Next***'.

vii) Do not do anything in this screen except click ***'Next'***.

viii) In the middle **right** of the pop-up box, there is an icon that looks like a **folder**. Click on this icon and navigate to***: I:\GIS DATA and MAPS\All Trimble Check In*** and **save the map**. <u>Make sure you remember where you save this map</u>; you will need it in future steps.

ix) In this window, in the lower **right** section, there is a **white box** with '***Map Name***' to its left. In this box **name the map**; chose something short but clear. Click ***'Next***'.

x) On the new screen, click ***'Finish'.***

xi) A **report** will appear letting you know if everything transferred properly. Click ***'Ok***'.

xii) You can now close out of ArcMap if you want.

c) **Connect Trimble to Computer**.

i) If you still have ArcPad open on your Trimble, close the program by tapping on the upper left icon (Trimble in a circle) and selecting ***'exit'***.

ii) Make sure the proper connecting cable is plugged into the computer. For the **2000 series** it will be a charging cradle, for the **6000 series** it will be a USB cord.

iii) On your computer, go to '**Start**' → '**All Programs'** → '**Windows Mobile Device Center'**. If a white pop-up window appears asking about setting up the Trimble, exit out of the window.

iv) Once '**Windows Mobile Device Center'** is opened, with your Trimble still turned on, attached it to its charger or USB cable (see step 4-b-ii). On the Trimble screen a pop-up box will appear letting you know it is connecting. It will also say '**Connecting'** on the '**Windows Mobile Device Center'** screen in the lower left corner**.** Once it is connected, the pop-up box on the Trimble will disappear and the '**Windows Mobile Device Center'** screen will say '**Connected**'* in the lower left corner. If a white pop-up window appears asking about setting up the Trimble, exit out of the window.

If it does not connect, repeat the step a couple more times. If it still doesn't want to work, you may need to re-start your computer. That will usually allow it to connect.

v) Repeat **steps 4-c-i thru 4-c-iv**.

d) Move ArcPad '*WaterLevelMonitoringSites'* formatted Map onto Trimble device.

i) Once connected, select '***Connect without setting up your device***'.

ii) Select '***File Management***'→ '***Browse the contents of your device***'.

iii) In the pop-up box that opens, double click the disk icon in the box on the right and navigate to '***My Documents***'. Leave that window open.

iv) On your computer, click '**Start**'→'**Computer'** to open a **'new file window'**.

v) In that **'new file window'**, navigate to where you just saved the **ArcPad** '**WaterLevelMonitoringSites' formatted Map** from **step 4b** and copy the entire file.

vi) Paste the Map you just copied in the **'new file window'** into the '***My Documents***' file in the '**Windows Mobile Device Center'** screen. A pop-up window will appear with a 'status bar' indicating the progress of the transfer. Once that box closes the transfer is complete.

vii) The map should now be loaded onto the Trimble. Close the '**Windows Mobile Device Center'** window and remove the Trimble from the cradle or cable.

viii) Go back to **step 3.**

5) Turn on the GPS function and make sure satellites acquire properly.

a) Turn on the GPS Function.

i) Do this **outside*** prior to heading into the field. That way if there are any problems are right by the office for assistance and/or to switch out Trimble units if necessary.

***Turning this feature on before heading outside will cause the battery to drain quickly as it tried to search for satellites from within the building**.*

ii) In the top toolbar, tap on the  icon. A second toolbar will appear underneath the top toolbar.

iii) On the second toolbar, tap on the  icon. It should (temporarily) turn blue and a **red** box should appear at the bottom of the screen with the words '**No Fix**'.
If this does not happen, tap on the black down arrow located immediately below the  icon. A dropdown menu should appear.

iv) Within the drop down menu, look for the heading '*GPS Active'* with  icon to its left. If there is not a **red** box outline around the icon, tap once on the '*GPS Active'* heading. The dropdown menu should disappear and a **red** box should appear at the bottom of the screen with the words '**No Fix**'. If there is a **red** box outline around the icon, the the GPS function has already been turned on.

b) Acquiring Satellites and Current Position.

i) Once the GPS function has been turned on, it will immediately start trying to acquire satellite signal. You must be outside and should not be too near buildings for this to work successfully.

ii) While it is trying to acquire the satellites, the **red** box with the words '**No Fix**' will continue to stay red. Additionally, you will get a white pop-up window that appears periodically with the message "*No current position fix at this time.*"

iii) Once the GPS has a strong enough signal, the **red** box with the words '**No Fix**' will turn **green** and the pop-up box will stop appearing. You can tap the small 'x' in the upper right corner of the **green** box to make it disappear so that you can better see the underlying map.

iv) **You may lose signal on occasion in the field**, especially when in a car. When this happens the pop-up box will reappear and keep appearing until you get a strong enough signal.
v) **Be careful when using the Trimble in a vehicle**. The vehicle may be moving faster than the Trimble is re-acquiring your current position. This can cause a 'lag' effect that can cause you to overshoot your destination.

USING THE TRIMBLE IN THE FIELD:

1) **Viewing the full extent of the map loaded on the Trimble.**
   a) Zoom out to see the full map that has been loaded.
      i) In the top toolbar, tap on the  icon. A second toolbar will appear.
      ii) Tap on the **black** arrow directly under the icon second from the left.
      iii) Select the '*Zoom to Full Extent*' option.
      iv) The icon above the black arrow will now change to  .
      v) Tap the icon once to view the full extent of the map loaded to the Trimble.

2) **How to adjust your view of the underlying map to a certain area.**
   a) Zooming in/out to a specific area. *****
      i) In the top toolbar, tap on the  icon. A second toolbar will appear
      ii) Tap on the **black** arrow directly under the left most icon.
      iii) Tap on the option that you want, either '*Zoom In*' or '*Zoom Out'*.
      iv) The icon above the black arrow will now change to either  or  **.
      v) Use your stylus to draw a square around the area you want to zoom to. Do this by placing the tip of the stylus to the top left of the area and then (while keeping continuous contact) dragging the stylus in a downward diagonal to your right.
      vi) The size of the box will impact the magnitude of the zoom. A small box will zoom the image further in or out than a larger box. *

      Keep in mind that once the GPS function is turned on and has acquired satellites, current Trimble settings will not allow you to zoom into an area that does not include your current position.

      *****If the icon you need is already the one that appears above the black arrow, then all you need to do is tap the icon prior to using your stylus on the screen.***

   b) How to 'Pan' (*move the screen without zooming*)
      i) In the top toolbar, tap on the  icon. A second toolbar will appear
      ii) Tap on the **black** arrow directly under the left most icon.
      iii) Tap on the 'Pan' option.
      iv) The icon above the black arrow will now change to  .
      v) Tap the screen to 'grab' it and without lifting the stylus, drag the image to the desired location.

c) Going back to your previous zoom extent.
   i) This function can be used if you unintentionally zoom too far in or out, or if you accidentally move the underlying image so that it is no longer where you need it to be.
   ii) In the top toolbar, tap on the  icon. A second toolbar will appear underneath the top toolbar.
   iii) Tap on the **black** arrow directly under the third icon from the left.
   iv) Select the 'Go Back to Previous Extent' option.
   v) The icon above the black arrow should now look like  .
   vi) Tap that icon once to go back one 'move'. You can tap the icon more than once if needed.

3) **Navigating to a location.**
   a) Knowing which way is north.
      i) The map in the Trimble is loaded so that when looking at the map, 'North' is always at the top of the Trimble (furthest from the 'power' button'). The underlying map does not reorient itself when you move around. In other words, if you have the top of the Trimble pointed east, north on the map will still be at the top of the Trimble. If confused, reorient the Trimble so the the top of the Trimble is pointed north (towards Harrison and Gadwall unit).

4) **Knowing where you are on the map.**
   a) Understanding the **red** circle.
      i) Once the Trimble has acquired a GPS signal, a **red** circle will appear on the map. This circle indicates where you are in relation to the map.
      ii) The Trimble settings are currently set so that you cannot zoom into an area of the map that does not include your **red** circle.
      iii) As you move around in the field, the Trimble unit will automatically adjust the underlying map so that your **red** circle, and subsequently, the current area you where are located is always in view.
      iv) Be aware that your '*level of zoom*' can impact how close you look to a designated spot. If you are zoomed way out, you may look like you are at a target location when in fact you may be several meters away. If you are zoomed in too close, every slight move will cause your **red** circle to 'jump' a distance on the screen. Subsequently, as you appear to get closer to a target, you may have to slowly zoom in more and more until you find that 'sweet spot' that lets you know you are where you should be without causing the **red** circle to jump all over the screen.

5) **Closing out of ArcPad at the end of the Day***
**This must be done in order to ensure the data collected during the day is properly saved.*

   a) Close out of ArcPad
      i) Tap the  icon in the upper left corner.
      ii) Tap '**Exit**'.
      iii) If it asks if you want to save changes, select 'Yes'.
      iv) You may see several processing bars flash across the screen – that is okay.
      v) ArcPad is now closed down.